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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,189	12/18/2001	Loien Richard Hoang	7616/100	1044

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EXAMINER

SINES, BRIAN J

ART UNIT

PAPER NUMBER

1743

DATE MAILED: 02/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/022,189

Applicant(s)

HUANG ET AL.

Examiner

Brian J. Sines

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a) in no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 15-21, 24-40 and 42-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 7, 12, 15-18, 21, 24-40 and 42-46 is/are rejected.
- 7) ☒ Claim(s) 3, 8-11, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-848)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 4 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, what does "its" in line 3 refer to? Does "its" refer to the electric field, the matrix or location? For precision and clarity in understanding the claim language in an unambiguous manner, the claim element, such as "electric field vector" or "matrix," for example, should be used instead of the term "it." This same rejection applies to claim 28.

Regarding claim 4, in line 7, does applicant intend to mean that the orientation of the second pulse is within a third and a *fourth* orientation?

Claim Rejections - 35 USC § 102

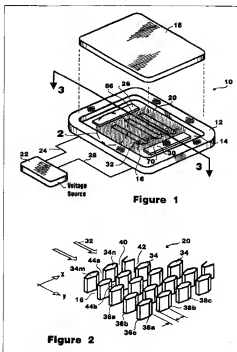
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

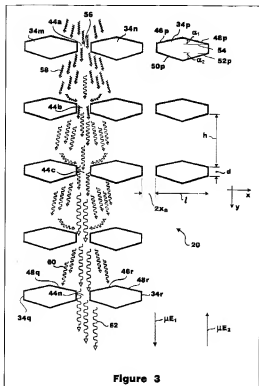
A person shall be entitled to a patent unless—

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 12, 15 – 18, 21, 24 – 40 and 42 – 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Ohkawa (U.S. Pat. No. 6,027,623 A). Regarding claims 1, 12, 18, 21 and 27, Ohkawa teaches a method and apparatus (10) for fractionating charged macromolecules,

such as DNA, wherein the apparatus comprises an array or matrix of obstacles (34) (see col. 4, lines 45 – 67 & col. 5, lines 1 – 57; figures 1 & 2). Ohkawa does teach that a uniform electric field and a reversed electric field may be utilized in the operation of the device in order to induce migration of the charged macromolecules through the array of obstacles within the apparatus to effect fractionation of the charged macromolecules (see col. 8, lines 1 – 67). Ohkawa teaches that during the operation of the device, the applied electric field can be varied both with regard to field magnitude and field direction across the device substrate (see col. 3, lines 6 – 67 & col. 4, lines 1 – 19). Ohkawa teaches that the applied electric fields may be asymmetrically applied, *i.e.*, the durations and intensities of the applied fields are varied or different (see col. 8; lines 31 – 59). Ohkawa teaches that the fractionation process may be performed continuously (see col. 3, lines 63 – 66). As recited in claim 3, Ohkawa teaches that the macromolecules being fractionated are injected or loaded at the first end of the device into a matrix of obstacles (34), and subsequently the fractionated macromolecules are directed toward the second end of the device for collection (see col. 9, lines 31 – 35). As shown in figure 2, the fractionated macromolecules exit the device at a plurality of locations from between the array of obstacles (34). Ohkawa teaches that the DNA macromolecules are extracted from the matrix of obstacles to be characterized after being fractionated (see col. 1, lines 1 – 19).





Regarding claims 27 – 40 and 42 – 46, these claims recite various functional limitations, such as the use of asymmetrically alternating electric fields during the fractionation process. In a claim drawn to an apparatus statutory class of invention, a functional limitation may not be divorced from any specifically recited structure or composition. A functional limitation is an attempt to define an apparatus by what it does, rather than by what it is, *as evidenced by its specific structure* (emphasis added). A functional limitation is often used in association with an

element to define a particular capability or purpose that is served by the recited element (see MPEP § 2173.05(g)). The Courts have held that apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. See *In re Danley*, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett-Packard Co. V. Bausch and Lomb, Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). The Courts have held that it is well settled that the recitation of a new intended use, for an old product, does not make a claim to that old product patentable. See *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The Courts have held that the manner of operating an apparatus does not differentiate an apparatus claim from the prior art, if the prior art apparatus teaches all of the structural limitations of the claim. See *Ex Parte Masham*, 2 USPQ2d 1647 (BPAI 1987) (see MPEP § 2114). Regarding claims 15 and 24, Ohkawa teaches that the macromolecules are loaded onto the apparatus using electric fields (see col. 3, lines 27 – 38). Regarding claims 16 and 25, Ohkawa teaches that the macromolecules are extracted from the matrix of obstacles using electric fields (see col. 3, lines 27 – 53). Regarding claims 17 and 26, Ohkawa teaches that the molecules are routed to the next processing step after fractionation, such as characterization (see col. 1, lines 11 – 19). Regarding claim 42, Ohkawa teaches that the apparatus comprises extraction structures for extracting fractionated molecules from the array of obstacles (see col. 3, lines 39 – 53). Regarding claim 43, Ohkawa teaches that the apparatus comprises a loading channel for loading molecules (see col. 3, lines 27 – 38).

The applicant is advised that although, the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). “The PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they

would be understood by one of ordinary skill in the art." See *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). "During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow." See *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). "The PTO broadly interprets claims during examination of a patent application since the applicant may 'amend his claim to obtain protection commensurate with his actual contribution to the art.'" (quoting *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550 (CCPA 1969)). See *In re Yamamoto*, 740 F.2d 1569, 1571, 222 USPQ 934, 936 (Fed. Cir. 1984). Although the apparatus an methodology as taught by the prior art may not be what the applicant intends as their claimed invention, the claims still encompass, and thereby do not exclude, the teachings of the prior art.

Allowable Subject Matter

Claims 3, 8 – 11, 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 2 and 4 – 7 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The cited prior art neither teach or fairly suggest that the method further incorporate a step of applying an asymmetric electric field to the matrix, wherein the step comprises applying to the matrix time-dependent electric fields whose odd-order integrals, as recited in claim 3, over time are not time-average field orientation for every n , where n is any positive even integer.

The cited prior art neither teach or fairly suggest that the method further incorporate a step of applying an asymmetric electric field, wherein the step comprises the steps of: alternating first and second electric pulses of first and second waveforms; maintaining the integral over time of one of the first or second pulses amplitudes larger than that the other pulse; and applying the first and second electric pulses at first and second fixed orientations.

The cited prior art neither teach or fairly suggest that the method further incorporate a step of varying the field orientation with time to create an asymmetrical electric field, wherein the step comprises varying the field orientation with time in such a manner that the integrals, as recited in claim 19, are not zero for every n , where n is any even integer larger than zero.

Response to Arguments

Applicant's arguments with respect to claims 1 – 12, 15 – 21, 24 – 40 and 42 – 46 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines, Ph.D. whose telephone number is (703) 305-0401. The examiner can normally be reached on Monday - Friday (11:30 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (703) 308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

February 19, 2004


Jill Warden
Supervisory Patent Examiner
Technology Center 1700